

SPARC's Stratospheric Sulfur and its Role in Climate Activity (SSiRC)

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& the SSiRC Team

What is SSiRC?

- Understanding the processes that control the stratospheric sulfur & aerosol budget
- Observing stratospheric sulfur and aerosol and reconciling the data sets from different instruments
- Modeling the climate feedback from the stratospheric aerosol layer
- Facilitating the development of an interactive aerosol layer in global chemistry climate modeling

SSiRC Activities

- Reporting on stratospheric sulfur science (papers)
- Activities (collaborations)
 - A stratospheric sulfur measurement capacity data base
 - SSiRC Model and Data intercomparison project
 - Improving the performance of climate models for volcanic events
 - A long-term stratospheric aerosol data base
 - Data Preservation
 - Planning the community response for the next major volcanic eruption
- Community gatherings (meetings)

SSiRC Sponsored Papers

- Stratospheric Sulfur Review Led by Stefanie Kremser
 - Highlights include a substantially improved agreement between in situ and space-based measurements of aerosol properties
 - 30+ coauthors, 7 countries
 - Manuscript is in final stages of production and submitted shortly
- International Space Science Institute (Bern, Switzerland) supported effort
- Stratospheric Sulfur Burden Led by Terry Deshler
 - Survey and compile measurements of stratospheric sulfur from instruments sensitive to gas phase sulfur (OCS and SO₂) and particle phase sulfur
 - Instruments on satellites, aircraft, balloons, and the ground will be included.
 - The goal is to present a temporal and spatial estimate of stratospheric sulfur based on the measurements available.

SSiRC Capacity Data Base

SSiRC is implementing a website featuring a comprehensive collection of links to available laboratory measurements, in-situ and remote data sets from ground based, aircraft, balloon and satellite platforms

<https://www.ssiirc.info/MainPage>

Led by Marc von Hobe

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Satellite Data Release to SSiRC

Instrument

Parameter	Satellite	Instrument	Data Products Measured	Time Period	Description (including reference to SSiRC)	Links and/or contacts
CALIPSO	CALIPSO		Total Aerosol Backscatter at 532 nm and 1064 nm and Volume Fraction at 532 nm	2006 -	CALIPSO is a spaceborne lidar that measures aerosol optical properties with a very good vertical resolution (~300 m in the stratosphere). It can be used to track aerosol plumes from volcanic fires and pollution in the lower Troposphere and lower Stratosphere. Specific stratospheric aerosol products will be available after year 2010.	CALIPSO Mission CALIPSO Data CALIPSO Data CALIPSO Data CALIPSO Data
			Stratospheric aerosol extinction coefficient profiles (100-1000 km)	1970-1990	SAFIR II extinction coefficient profiles were used at high altitudes in each hemisphere. These provided key information on the occurrence of large-scale volcanic dusts including the first volcanic dusting of the stratosphere and the high latitude impact of several volcanic eruptions.	Nimbus II Data Nimbus II Data Nimbus II Data Nimbus II Data
AEROS	SAGE		Stratospheric aerosol extinction coefficient profiles (100-1000 km)	1970-1990	SAGE II provided key observations of 1 km resolution stratospheric aerosol and aerosol extinction coefficient profiles at 100-1000 km.	SAGE II Data SAGE II Data SAGE II Data SAGE II Data
			Stratospheric aerosol extinction coefficient profiles (100-1000 km)	1984-2000	SAGE II provided key observations of 1 km resolution stratospheric aerosol and aerosol extinction coefficient profiles at 100-1000 km.	ERBS Data ERBS Data ERBS Data ERBS Data
Meteor-M	SAGE II		Stratospheric aerosol extinction coefficient profiles (100-1000 km)	2002-2003	SAGE II provided key observations of 1 km resolution stratospheric aerosol and aerosol extinction coefficient profiles at 100-1000 km.	Meteor-M Data Meteor-M Data Meteor-M Data Meteor-M Data
			Stratospheric aerosol extinction coefficient profiles with ~2 km vertical resolution at wavelengths of 0.46, 0.63, and 0.88 µm	1991-2000	The Halogen Occultation Experiment (HALOE) was launched on the Upper Atmosphere Research Satellite (UARS). The instrument was used to measure aerosol profiles at 0.46, 0.63, 0.88, 1.03, 1.38, 1.65, 1.87, 2.13, 2.38, 2.63, 2.88, 3.13, 3.38, 3.63, 3.88, 4.13, 4.38, 4.63, 4.88, 5.13, 5.38, 5.63, 5.88, 6.13, 6.38, 6.63, 6.88, 7.13, 7.38, 7.63, 7.88, 8.13, 8.38, 8.63, 8.88, 9.13, 9.38, 9.63, 9.88, 10.13, 10.38, 10.63, 10.88, 11.13, 11.38, 11.63, 11.88, 12.13, 12.38, 12.63, 12.88, 13.13, 13.38, 13.63, 13.88, 14.13, 14.38, 14.63, 14.88, 15.13, 15.38, 15.63, 15.88, 16.13, 16.38, 16.63, 16.88, 17.13, 17.38, 17.63, 17.88, 18.13, 18.38, 18.63, 18.88, 19.13, 19.38, 19.63, 19.88, 20.13, 20.38, 20.63, 20.88, 21.13, 21.38, 21.63, 21.88, 22.13, 22.38, 22.63, 22.88, 23.13, 23.38, 23.63, 23.88, 24.13, 24.38, 24.63, 24.88, 25.13, 25.38, 25.63, 25.88, 26.13, 26.38, 26.63, 26.88, 27.13, 27.38, 27.63, 27.88, 28.13, 28.38, 28.63, 28.88, 29.13, 29.38, 29.63, 29.88, 30.13, 30.38, 30.63, 30.88, 31.13, 31.38, 31.63, 31.88, 32.13, 32.38, 32.63, 32.88, 33.13, 33.38, 33.63, 33.88, 34.13, 34.38, 34.63, 34.88, 35.13, 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